JAPAN PATENT OFFICE

This is to certify that the annexed is a true copy of the following application as filed with this office.

Date of Application: June 15, 2000

Application Number: Japanese Patent Application No. 2000-180032

Applicant(s): FUJI XEROX CO., LTD.

May 25, 2001

Commissioner,

Patent Office:

(Seal)

Issue No. 2001-3044949

[Name of Document]	Patent Application
[Reference Number]	FE00-00373
[Submission Date]	June 15, 2000
[Addressed To]	Commissioner, Patent Office, Esq.
[International Classification]	G06F 17/60
[Inventor]	
[Address or Residence]	c/o Fuji Xerox Co., Ltd., 17-22, Akasaka 2-chome, Minato-ku, Tokyo
[Name]	Tetsuya KIYOSU
[Inventor]	
[Address or Residence]	c/o Fuji Xerox Co., Ltd., 17-22, Akasaka 2-chome, Minato-ku, Tokyo
[Name]	Satoshi SUZUKI
[Inventor]	
[Address or Residence]	c/o Fuji Xerox Co., Ltd., 2274 Hongo, Ebina-shi, Kanagawa
[Name]	Hirofumi KURAMOTO
[Inventor]	
[Address or Residence]	c/o Fuji Xerox Co., Ltd., 2274 Hongo, Ebina-shi, Kanagawa
[Name]	Nobuhisa KATOH
[Inventor]	
[Address or Residence]	c/o Fuji Xerox Co., Ltd., 17-22, Akasaka 2-chome, Minato-ku, Tokyo
[Name]	Eisuke KAWASAKI
[Applicant for Patent]	
[Identification Number]	000005496
[Name or Appellation]	FUJI XEROX CO., LTD.

[Agent]

[Identification Number]	100101948
[Patent Attorney]	
[Name or Appellation]	Masao YANAGISAWA
[Telephone Number]	(045)744-1878

[Indication of Fee]

[Registered Number of Prepayment]	059086
[Amount of Payment]	21,000 yen

[List of Attached Documents]

[Article]	Specification	1
[Article]	Drawings	1
[Article]	Abstract	1
[General Power of Attorney No.]	9204691	
[Request for Proof]	Yes	

[Name of Document] Specification

[Title of the Invention] Remote Color Proofing System

[Scope of Claims]

[Claim 1] A remote color proofing system that enables an output unit connected through network to output a color image, the remote color proofing system characterized by comprising:

color proof preparation means for performing color conversion processing for original data so as to conduct precise color reproduction in the output unit specified as an output target, and for converting the original data into raster data;

communication means for transferring the raster data converted by the color proof preparation means via the network to the specified output unit.

[Claim 2] The remote color proofing system according to claim 1, characterized in that the network is the Internet.

[Claim 3] The remote color proofing system according to claim 2, characterized by further comprising:

instruction means for specifying the output unit that outputs the color image, wherein the color proof preparation means performs the color conversion processing in accordance with specification of the output unit by the instruction means, and the communication means transfers the raster data to the output unit specified by the instruction means.

[Claim 4] The remote color proofing system according to claim 1 or claim 2, characterized in that the communication

means receives instruction information instructing an output unit, which is an output destination, as well as the original data and transfers the raster data in accordance with the instruction information, and the color proof preparation means performs the color conversion processing for the original data received by the communication means in accordance with the instruction information received by the communication means so as to conduct the precise color reproduction in the corresponding output unit and converts into the raster data.

[Claim 5] The remote color proofing system according to claim any one of claims 1 to 4, characterized in that calibration at a color conversion time is performed based on a color sample output by the output unit.

[Claim 6] The remote color proofing system according to any one of claims 1 to 4, characterized in that the output unit has a function of transmitting calibration information indicating color reproduction change with time, the color proof preparation means obtains the calibration information, which is output from the output unit through the network, from the communication means, and calibration at a color conversion time is performed based on the calibration information

[Claim 7] The remote color proofing system according to any one of claims 1 to 6, characterized in that the output means has a function of transmitting color reproduction parameter information at an output time; and after transmitting

the raster data, the color proof preparation means receives the parameter information, which is transmitted from the output means through the network, from the communication means, determines whether or not parameters at the color conversion time is adequate and outputs the color conversion processing is adequate, and outputs a determination result.

[Claim 8] A remote color proofing system, in which a plurality of processing systems are connected via a network, configured so that a similar color image can be obtained any of the processing systems including an output unit, the remote color proofing system characterized in that at least one of the plurality of processing systems is used as a center; and the center has color proof preparation means for performing color conversion processing responsive to an output unit in the processing system, which outputs the color image, for original data on which the color image is based, and converting the original data into raster data.

[Claim 9] The remote color proofing system according to claim 8, characterized in that when a plurality of centers exist, a center to be used is selectable.

[Claim 10] The remote color proofing system according to claim 8 or claim 9, characterized in that a processing system of a third party other than a plurality of parties involved in business is connected to the network, and at least the processing system of the third party is used as the center.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The invention relates to a remote color proofing system that enables an output unit connected to a network to output a color image.

[0002]

[Conventional Art]

To prepare printed matter, steps of planning, design, production, proofreading, plate-making, plate, and final printing are executed. Various peoples and enterprises are involved in the steps. In recent years, a mechanized system has been used in the process from plate-making to printing. The steps of planning, design, and production are also being mechanized with widespread use of personal computers, etc. However, under the present circumstances, particularly the proofreading relies on the manpower.

[0003]

In the proofreading work, the whole design, placement of characters and images, colors and fonts of parts, and the like are checked in detail elaborately for completing printed matter responsive to the demand of the orderer. In the proofreading work, the orderer and the production department and the departments on and after the plate-making communicate with each repeatedly until the proof is OKed.

[0004]

Particularly, if the orderer is a color-minded orderer, color matching is executed multiple times during the proofreading. At this time, as the sample (color proof) shown for the orderer, the same color as the final printed matter must be reproduced; otherwise, the proof is not OKed and if the final printed matter color differs from the color proof, an objection is raised to the final printed matter.

[0005]

However, various types of output units adopting different print technologies are used and color development varies from one type to another. For example, an electrophotographic output unit and an ink jet output unit differ in used color material, color of each color material, and color development mechanism. In addition to the variations in color development from one print technology to another, the output units adopting the same print technology differ in machine property. Thus, if the same color data is used electronically, the actual print color varies delicately depending on the output unit for providing printout. Further, the color may change with time even if the same output unit is used.

[0006]

Since the color thus varies from one output unit to another, if different printers are used in departments involved in each process, such as the design company, the production company,

and the plate-making company, the colors of the color-proofs printed out in the design department and the production department, the colors of the color-proofs printed out in the departments on and after the plate-making department, and the colors intended by the orderer may differ. It is impossible to conduct color proofreading for a long, long time.

[0007]

Since the computer is introduced into the production process as described above, it is possible to send produced electronic data to the orderer and print the electronic data and proofread in the orderer. Most simply, the electronic data of printed matter prepared in the production department is transmitted to the order, for example, by mail, etc., and the orderer prints out the electronic data on the orderer's printer, etc., and proofreads. In this case, however, the orderer prints based on color adjustment of the orderer and thus the production department and the orderer use different printers as described above, so that colors of the color proofs are different. The orderer does not see the fact that the color differs from that produced in the production department, and gives an OK, leading to trouble of a discrepancy between the finished printed matter color and the intended color.

[0008]

As a system for printing out in the same hue or tint in the production department and the orderer, it is possible to

execute color conversion and output in their respective departments so as to output the same color. FIG. 4 is a schematic representation of an example of a conventional remote color proofing system. In the figure, numeral 71 denotes a production party system, numeral 72 denotes an ordered party system, numeral 73 denotes the Internet, numerals 81 and 91 denote output instruction sections, numerals 82 and 92 denote color management sections, numerals 83 and 93 denote rasterizers, and numerals 84 and 94 denote output units. The production party system 71 and the ordered party system 72 have the same configuration and are connected by the Internet 73.

[0009]

In the production party system 71, when an instruction for printing original data is given in the output instruction section 81, color conversion processing responsive to the output unit 84 is performed in the color management section 82. The original data after undergoing the color conversion is converted into raster data in the rasterizer 83 and the raster data is printed out by the output unit 84.

[0010]

On the other hand, the original data is sent from the production party system 71 through the Internet 73 to the ordered party system 72. In the ordered party system 72, when an instruction for printing the original data sent from the production party system 71 is given in the output instruction

section 91, color conversion processing responsive to the output unit 94 is performed in the color management section 92. The original data after undergoing the color conversion is converted into raster data in the rasterizer 93 and the raster data is printed out by the output unit 94.

[0011]

In the color image processing system, the color management section 82 of the production party system 71 and the color management section 92 of the ordered party system 72 execute color conversion so as to print in the same color on the output units 84 and 94. At this time, the print technology difference, the machine property difference, and the like as described above are considered for executing the color conversion. Thus, if the output unit 84 of the production party system 71 and the output unit 94 of the ordered party system 72 differ, the same color can be reproduced on output printed matter.

[0012]

To construct such a color image processing system, a system including the color management section and the rasterizer must be installed for each of the departments (enterprises, offices, etc.,) for printing out. To prepare printed matter, usually a large number of enterprises, offices, etc., are involved as described above. Thus, the system as described above needs to be installed in every involved company.

[0013]

However, the color management section must execute color conversion responsive to the output unit as described above and thus very skilled adjustment and setting are required. The rasterizer comprises an enormous number of fonts (several hundreds) in the print field and is intended for responding to any requests. Fonts will be added whenever necessary upon request. The fonts are very expensive and cannot be purchased in small and medium-sized enterprises, offices, etc. The number of experts who can carry out skilled color adjustment and setting is limited and general operators easily cause a color difference to occur by erroneous operation. Thus, the system as shown in FIG. 8 is not generally available and in most cases, paper, etc., is still passed and the productivity is poor.

[0014]

[Problem to be Solved by the Invention]

The invention has been made in view of the circumstances set forth above, and it is an object of the invention to provide a remote color proofing system that can be constructed at low costs and moreover enables any output units connected to a network to output color proofs reproduced in precise colors.

[0015]

[Means for Solving the Problem]

In the invention, color proof preparation means performs color conversion processing for original data so as to conduct

precise color reproduction in the output unit specified as an output target, and further converts the original data into raster data. Then, the raster data provided by the color proof preparation means is transferred via a network to the specified output unit. Accordingly, for example, if a transfer destination is an output unit connected via the Internet, a telephone line, etc., color conversion processing responsive to the output unit is performed and a color proof reproduced in precise color is output from the output unit. Since the color proof preparation means also converts the original data into raster data using a large number of fonts, etc., an enormous number of fonts need not be provided at the transfer destination. Thus, at the transfer destination, an expensive apparatus for performing color conversion processing and converting original data into raster data is not required and a skilled operator is not needed either and a color proof reproduced in precise color can be provided. Thus, for example, if the color proof preparation means and communication means are placed in any of the printed matter design and production department, the orderer, the printing department after plate making, etc., printed matter of the same color can also be provided in other departments and the orderer, and color proofreading work can be advanced smoothly. Trouble of a discrepancy between the color in the production process and the actual printed matter color or the like can also be prevented from occurring.

[0016]

Specification of the output unit and input of the original data can be executed through attached instruction means or can be received via the network from an external system. In the output unit to which the converted raster data is transferred, the reproduced color may vary with time. To correct such color change with time, for example, a color sample is output from the output unit at some timing and calibration at the color conversion time in the color proof preparation means can be executed using the color sample. If the output unit has a function of transmitting calibration information indicating color reproduction change with time, calibration at the color conversion time can be executed based on the calibration information. Accordingly, whenever the output unit prints out, a color proof reproduced in precise color can be provided.

[0017]

To check whether or not precise color reproduction is actually accomplished on the output unit, for example, when the output unit prints out, color reproduction parameter information at the time may be returned. The color proof preparation means compares the returned parameter information with the parameter at the color conversion processing time, determines whether or not the color conversion processing is adequate, and outputs the determination result. Accordingly, the color proof preparation means can know whether or not the

raster data sent to the output unit is printed out as precise color reproduction.

[0018]

Further, the invention provides a remote color proofing system wherein a plurality of processing systems are connected via a network; at least one of the plurality of processing systems is used as a center; and the center has color proof preparation means for performing color conversion processing responsive to an output unit in the processing system for outputting the color image, for original data on which the color image is based, and converting the original data into raster data. Accordingly, an expensive apparatus for performing color conversion processing and converting original data into raster data is not required and a skilled operator is not needed either in any processing system other than the center and a color proof reproduced with precise colors can be provided in any processing systems containing the output unit, as described above. A plurality of the centers may exist so that one of them can be selected. A processing system of a third party other than business parties concerned may serve as the center.

[0019]

[Embodiments of the Invention]

FIG. 1 is a block diagram to show a first embodiment of a remote color proofing system of the invention. In the figure, numeral 1 denotes a center system, numerals 2 and 3 denote remote

systems, numeral 4 denotes a network, numeral 11 denotes an instruction terminal, numeral 12 denotes a color proof preparation section, numeral 13 denotes a color conversion section, numeral 14 denotes a color conversion table, numeral 15 denotes a rasterizing section, numeral 16 denotes a font storage section, numerals 17, 22, and 32 denote communication sections, and numerals 18, 21, and 31 denote output units. In the remote color proofing system shown in FIG. 1, the center system 1 and the remote systems 2 and 3 are connected by the network 4. For example, the remote color proofing system can be constructed by installing the center system 1 in a production company and the remote systems 2 and 3 in an orderer and a printing company. Of course, the number of the remote systems that can be connected to the center system 1 is not limited to two, and any number of remote systems may be connected. Every communication form regardless of wired or radio, such as a telephone line, a satellite line, the Internet, and a LAN, can be used as the network 4. Further, not only one-to-one communications, but also one-to-multiple broadcast-type communications are included.

[0020]

The center system 1 has the instruction terminal 11, the color proof preparation section 12, the communication section 17, the output unit 18, etc., which may be connected in any form and can be implemented as a system connected by a LAN,

etc., for example. The instruction terminal 11 is used to give an instruction for inputting original data to the color proof preparation section 12 and specify the output unit to print out. In the example, the output unit 18, the output unit 21 in the remote system 2, the output unit 31 in the remote system 3, or the like can be specified. More than one instruction terminal 11 may be connected. The instruction terminal 11 need not be a dedicated terminal and may be a terminal installing software that can give an instruction to the color proof preparation section 12. Further, the instruction terminal 11 may be implemented as an operation section of the output unit 18, the color proof preparation section 12 may function in the instruction terminal 11, or the instruction terminal 11, the color proof preparation section 12, and the output unit 18 may be in one piece. If the instruction terminal 11 is placed in the output unit 18, workability can be more enhanced.

[0021]

The original data is arbitrary and may be, for example, code data using PDF, html/XML, etc., prepared in the instruction terminal 11 or any other computer, bit map data prepared using a graphics function, an image read through an image reader, or a mixture thereof. The original data may be stored, for example, in the instruction terminal 11 or any other computer, read, sent to the color proof preparation section 12 through LAN, etc., or supplied through the network from the outside

or using a portable record media such as floppy disk. Readers of the storage media as well as an image reader may be added to the instruction terminal 11.

[0022]

The output unit 18 prints out based on raster data prepared in the color proof preparation section 12, so that a color proof can be obtained in the center system 1. There may be a system to which the output unit 18 is not connected, or two or more output units may be connected. The instruction terminal 11 may be implemented using operation and display sections of the output unit 18.

[0023]

The color proof preparation section 12 has the color conversion section 13, the color conversion table 14, the rasterizing section 15, the font storage section 16, etc. The color conversion section 13 performs the color conversion processings for the original data so as to perform precise color reproduction in the output unit specified as an output target by the instruction terminal 11. Color conversion parameters are registered in the color conversion table 14. The output units differ in color reproducibility because of the print technology, machine property difference, etc., as described above. Thus, different color conversion parameters can be registered not only when the output units adopt different print technologies, but also when the output units differ in model

although the same print technology is adopted. Further, if the output units are of the same model, the color conversion parameter can also be registered in the color conversion table 14 for each output unit considering the machine property difference therebetween. The color conversion section 13 acquires the color conversion parameter corresponding to the output unit specified by the instruction terminal 11 from the color conversion table 14 and performs the color conversion processing based on the parameter. In this way, the color conversion section 13 performs the color conversion processing to fit the output unit, which is the output target. To deal with such a case where no color conversion parameter is registered in the color conversion table 14, the instruction terminal 11 may be configured so that color conversion parameters can be entered.

[0024]

The rasterizing section 15 converts into raster data the original data after undergoing the color conversion processing in the color conversion section 13. The rasterizing section 15 converts into the raster data while using font data stored in the font storage section 16. The font storage section 16 stores vast amounts of fonts, and is configured so as to be able to respond to the orderer's requests.

[0025]

The raster data converted by the rasterizing section 15

is sent to the output unit specified through the instruction terminal 11. If the output unit 18 is specified, the raster data is sent to the output unit 18 in the center system 1 and a color proof is printed out from the output unit 18. If the specified output unit is the output unit 21 in the remote system 2 or the output unit 31 in the remote system 3, the raster data is transmitted to the remote system 2 or 3 via the communication section 17 through the network 4.

[0026]

The remote systems 2, 3 are respectively provided with the communication section 22, 32 for communicating with the center system 1 and the output unit 21, 31. In the remote system 2, the raster data sent from the center system 1 is received at the communication section 22 and can be printed out by the output unit 21 for providing a color proof. Likewise, in the remote system 3, the raster data sent from the center system 1 is received at the communication section 32 and can be printed out by the output unit 31 for providing a color proof. The output units 21 and 31 may be units using various print technologies, such as electrophotographic and ink jet technologies, and may be of any models.

[0027]

In the first embodiment of the remote color proofing system of the present invention, in the case where the output unit 21 of the remote system 2 is caused to print out a color proof

based on original data prepared by the center system 1, the original data and the fact that an output destination is the output unit 21 of the remote system 2 are specified from the instruction terminal 11 of the center system 1. The color conversion section 13 of the color proof preparation section 12 acquires the color conversion parameter corresponding to the output unit 21 specified as the output destination from the color conversion table 14 or directly from the instruction terminal 11, and performs color conversion processing for the original data according to the obtained color conversion parameter. Further, the original data after undergoing the color conversion processing is passed to the rasterizing section 15, which then converts the original data into raster data using the font stored in the font storage section 16. Since the output unit 21 in the remote system 2 is specified as the output unit, the raster data converted by the rasterizing section 15 is transferred from the communication section 17 through the network 4 to the remote system 2.

[0028]

The raster data sent from the center system 1 is the data for which the color conversion processing is performed in the color conversion section 13 corresponding to the output unit 21 and thus may be printed out intact on the output unit 21. Accordingly, a color proof on which color reproduction is precisely executed can be provided.

[0029]

In a similar manner, a color proof is printed out from the output unit 31 in the remote system 3 based on the original data prepared in the center system 1. Also in this case, the raster data for which color conversion processing is performed in the color conversion section 13 corresponding to the output unit 31 is sent to the remote system 3, and thus if the raster data is printed out intact on the output unit 31, a color proof on which color reproduction is precisely executed can be achieved. Further, if the output unit 18 in the center system 1 is specified as the output unit, the raster data converted by the rasterizing section 15 is transferred to the output unit 18 and a color proof is printed out by the output unit 18. Also in this case, the color conversion section performs color conversion processing corresponding to the output unit 18, and thus a color proof on which color reproduction is precisely executed can be achieved as in the cases where the raster data is printed out by the output unit 21 or 31.

[0030]

As described above, since the color conversion processing is performed according to the respective output units, the color proof printed out with substantially the same color reproduction can be achieved whenever any output unit outputs. Thereby, when proofreading a printed matter, the design division, the orderer and the printing division can refer to the same color

proof. Therefore, even if companies serving as these roles are apart from, the proofreading can be advanced efficiently.

[0031]

Also, in comparison with the conventional system shown in Fig. 4, there is no need to provide the color proof preparation section 13 in the remote systems 2, 3. Therefore, the remote color proofing system can be constructed, which can obtain the color proof whose color is reproduced precisely, without putting the remote systems 2, 3 to expense.

[0032]

If a remote system is added or an additional output unit is installed in any remote system or the existing output unit is replaced with another one, color conversion parameter corresponding to the added or replacing output terminal may be registered in the color conversion table 14 so that it becomes possible to specify the added or replacing output unit through the instruction terminal 11. Of course, the color conversion parameter can also be deleted.

[0033]

Furthermore, even if the same output unit is used, there is a case where the color reproducibility varies due to its internal change with time. In order to deal with such a change in the color reproducibility with time and to always perform accurate color reproduction, the parameter may calibrated when performing the color conversion processing for each output unit.

Fig. 2 shows an example when the calibration is performed in the first embodiment of the remote color proofing system o the invention. The numerals in the figure are the same as those in Fig. 1. As a calibration method, there is a method of causing an output unit to print out a color sample and performing calibration based on the color sample. Fig. 2 shows the example in which the calibration is performed in the remote system 2 according to this method. The output unit 21 is caused to print out a color sample including predetermined color patches, and the color sample is collected. The color sample is read, for example, by a reader in the center system 1, and a color analysis is performed therefor. Parameters obtained through the analysis are registered in the color conversion table 15 with being associated with the output unit 21. In this way, the color conversion parameter is updated in response to the change with time in the color reproducibility of the print device 21, and it makes possible to always perform accurate color reproduction. It is noted that the color samples may be collected when periodical maintenance work for output units is performed or at an appropriate timing.

[0034]

Also, as another calibration method, for example, if the output unit can transmit its calibration information, such calibration information can be used. In Fig. 2, if the output unit 31 of the remote system 3 can transmit calibration

information, for example, the output unit 31 transmits the calibration information to the center system 1 through the communication section 32 and the network in response to request from the center system 1 or periodically. The center system 1 receives the transmitted calibration information through the communication section 17 and updates the color conversion parameter corresponding to the output unit in the color conversion table 14. Thereby, the change with time in the color reproducibility of the output unit can be treaded and the accurate color reproduction can always be performed.

[0036]

In a case where such calibration information can be obtained in the output unit, if the output unit cannot transmit to the center system 1, the color conversion table 14 may be updated by displaying or printing out the calibration information and then collecting it. In this case, for example, contents of the color conversion table 14 may be displayed on the instruction terminal 11 and be editable. Of course, registration of a new output unit or data correction of the color conversion table 14 when replacing an output unit may be enable through the instruction terminal 11.

[0037]

If calibration is performed in response to change of the output unit with time as described above, correct color reproduction is always conducted. However, if such calibration

is too late and large color change occurs in the output unit, correct color reproduction is not conducted. When the output unit is replaced with another one, if an instruction to output a color proof is given without changing the color conversion table 14 accompanying replacement of the output unit, a color proof whose color not precisely reproduced is output from the output unit. In such a case, the situation can also occur in which the transmitting party is not aware that a color proof whose colors are not precisely reproduced is output at the receiving party. To prevent such a situation, for example, it is possible for the output unit 21, 31 in the remote system 2, 3 printing out a color proof to return the color reproduction parameter at the printing-out time to the center system 1. Upon receiving the parameter through the communication section 17, the center system 1 can check the parameter in the color conversion table 14, which was used to prepare the raster data of the color proof transmitted, and the parameter received from the remote system 2, 3 to determine whether or not color reproduction is conducted correctly. The determination result can be output to or displayed on the instruction terminal 11, any other terminal, the output unit 18, etc., for example. Of course, an error message may be output only when it is determined that color reproduction is conducted incorrectly.

[0038]

Thus, it is made possible for the transmitting party to

know the fact that precise color reproduction is not conducted on the output unit at the receiving party. Of course, the above-described method is an example and the system can be configured so that the transmitting party can know whether or not color reproduction is correctly conducted at the receiving party according to various methods. Such determination is made at several stages and, for example, the center system can previously warn the remote system that the calibration time will soon come, and then can output an error message indicating that color reproduction is not correct. Of course, not only such information as to whether or not color reproduction is correct, but also information as to what condition (parameter, etc.,) the color proof is printed out under may be output.

[0039]

Fig. 3 shows a configuration diagram of a second embodiment of a remote color proofing system of the invention. In the figure, the same numerals are assigned to parts, which are the same as those in Fig. 1, and description thereon will be omitted. Numeral 5 denotes a remote device, numeral 51 denotes an output unit, numeral 52 denotes a communication section and numeral 53 denotes an instruction terminal. In the second embodiment, the center system 1 receives original data and specification of an output unit from outside, performs color conversion to convert into raster data so that accurate color reproduction can be achieved on the specified output unit and transfers the

raster data to the specified output unit to cause it to print out.

[0040]

The communication section 17 of the center system 1 receives the original data and the specification of the output unit through the network 4. Then, the communication section 17 inputs the original data to the color conversion section 13 while transmitting the specification of the output unit. Thereby, the color conversion section 13 performs the color conversion processing with using the color conversion table 14 so that so that accurate color reproduction can be achieved on the specified output unit as described above. Furthermore, the rasterizing section 15 converts the color-converted original data into the raster data while using fonts stored in the font storage section 16. Then, the converted raster data is sent from the communication section 17 to the specified output unit.

[0041]

In an example shown in Fig. 3, it is assumed that original data and the specification of an output unit are entered through the remote system 5. The remote system 5 includes an output unit 51, a communication section 52, and an instruction terminal 53. The instruction terminal 53 can transmit the original data while specifying the output unit, which should print out the original data, and can instruct print output. When print output

is instructed in the instruction terminal 53, the communication section 52 transmits the original data and the specification of the output unit, which should print out, to the center system 1 through the network 4. Furthermore, the communication section 52 receives the raster data, which is to be printed out on the output unit 51 and transmitted from the center system 1 through the network 4, and transfers it to the output unit 51. The output unit 51 may be of desirable printing system and of desirable model. Also, the instruction terminal 53 may be a general-purpose computer. It is noted that a remote system having the instruction terminal such as the remote system 5 is not limited to one. A plurality of remote systems may be connectable to the network.

[0042]

Brief description will be given on an operation in the case where the output unit 31 of the remote system 3 is caused to print out a color proof according to an instruction from the remote system 5 in this second embodiment of the remote color proofing system of the invention. In the instruction terminal 53, original data to be printed out is specified while the output unit 53 of the remote system 3 is specified as an output transmits information indicating that the output destination is the output unit 31 of the remote system 3 as well as the specified original data, to the center system 1 through the network 4.

[0043]

The center system 1 receives at the communication section 17 the original data and the information indicating that the output unit 31 is specified as the output destination, which are transmitted from the remote system 5. The center system 1 transfers those to the color conversion section 13 of the color proof preparation section 12. The color conversion section 13 acquires color conversion parameter corresponding to the output unit specified as the output destination, from the color conversion table 14 and performs color conversion processing for the original data in accordance with the color conversion parameter. Furthermore, the original data undergone the color conversion is transferred to the rasterizing section 15, and is converted into raster data in the rasterizing section 15 with using the fonts stored in the font storage section 16. The converted raster data is transferred to the remote system 3 through the communication section 17 and the network 4. The remote system 3 receives at the communication section 32 the raster data transmitted through the network 4, and transmits it to the output unit 31. Thereby, a color proof can be printed out from the output unit 31.

[0044]

In this way, the color proof of the original data specified in the remote system 5 is output from the output unit 31 of the remote system 3. The raster data transmitted to the remote

system 3 is undergone the color conversion processing corresponding to the output unit 31. Therefore, when the raster data is intact printed out, the color proof whose color is reproduced precisely can be printed out.

[0045]

It is noted that in the case where the color proof of the original data specified in the remote system 5 is output from the output unit 21 of the remote system 2, processings are similar. Also, in the case where the output unit 51 of the remote system 5 outputs, after the output unit 51 is specified as an output destination, the original data is transferred to the center system 1, and the raster data is received from the center system 1 and printed out from the output unit 51.

[0046]

In the second embodiment of the remote color proofing system of the invention, companies and/or offices creating printed matters such as a design company, an orderer's company and a printing company can share the external center system 1. For example, it is assumed that the remote system 5 is the design company and that the remote system 2 is the orderer. If the remote system 5 causes the output unti 21 of the remote system 2 to print out a color proof, the orderer can perform proofreading with the color proof color-reproduced accurately. Likewise, the same color proof can be sent to the printing company.

[0047]

In this way, since the center system 1 is shared, even if companies and/or offices creating printed matters don't buy a system including an expensive color proof preparing section 12, the companies and/or offices can obtain color proofs whose color is reproduced precisely, at their office. Therefore, medium and small companies, which cannot buy expensive systems, can fulfill demands from an orderer requesting exact colors, and can plan and create printed matters, which use various fonts.

[0048]

The shared center system 1 may be installed in one or more processing systems of the companies, offices, etc., involved in preparing of printed matter, for example, and in addition, may be operated in common as another processing system by the companies, etc., using the system or may be provide by a third party. To operate the center system 1 in common or administrate the center system 1 by a third party, the administration company can also collect a charge for use of the center system 1.

[0049]

In the second embodiment, it is possible to calibrate the output unit in each remote system, as in the first embodiment. Also, in such a system configuration, color conversion parameter corresponding to an output unit of an output destination is set in advance, and when an output unit is first specified as

an output destination or when an output request of a color proof is made to an output unit, calibration information or the like may be acquired from the output unit to automatically set the color conversion parameter. Furthermore, as in the first embodiment, information as to whether or not color reproduction is correct or information as to what condition (parameter, etc.,) the color proof is printed out under may be notified to a requester.

[0050]

[Advantage of the Invention]

As apparent from the above description, according to the invention, any output device can print out a color proof whose color is reproduced precisely in each company and office engaging in preparation of printed matters, with a very cheap system configuration. Thereby, an orderer division, a design division, and a printing division can proofread with using color proofs having the same color reproduction, and creating printed matters can be advanced efficiently.

[Brief Description of the Drawings]

[Fig. 1] A configuration diagram showing a first embodiment of a remote color proofing system of the invention.

[Fig. 2] An explanatory diagram showing an example when calibration is performed in the first embodiment of the remote color proofing system of the invention.

[Fig. 3] A configuration diagram showing a second

embodiment of a remote color proofing system of the invention.

[Fig. 4] An explanatory diagram showing an example of a conventional remote color proofing system.

[Description of Numerals]

1 … center system, 2, 3 … remote systems, 4 … network, 11 … instruction terminal, 12 … color proof preparation section, 13 … color conversion section, 14 … color conversion table, 15 … rasterizing section, 16 … font storage section, 17, 22, 32 … communication section, 18, 21, 31 … output unit, 5 … remote device, 51 … output unit, 52 … communication section, 53 … instruction terminal, 71 … production party system, 72 … ordered party system, 73 … the Internet, 81, 91 … output instruction sections, 82, 92 … color management sections, 83, 93 … rasterizers, 84, 94 … output units

[Name of Document] Abstract of the Disclosure

[Abstract]

[Object] To provide a cheap color remote proofing system, which can output a color proof whose color is reproduced precisely, from any output unit on the network.

[Solving Means] When an output unit, which is an output target, is specified through an instruction terminal 11 and original data is input to a color proof preparation section 12, a color conversion section 13 acquires a color conversion parameter corresponding to the specified output unit from a color conversion table 14 and performs color conversion processing for the original data so as to accomplish precise color reproduction in the specified output unit. A rasterizing section 15 converts the original data after undergoing the color conversion processing into raster data while using an enormous number of fonts in a font storage section 16. The raster data provided by the rasterizing section 15 is transmitted from a communication section 17 through a network 4 to the specified output unit. If a remote system 2 or 3, which receives the raster data, prints out on output unit 21 or 31, a color proof whose color is reproduced precisely can be provided.

[Selected Drawing] Fig. 1

提出日 平成１２年 ６月１５日
整理番号＝ＦＥ００－００３７３ 特願2000-180032 頁: 1/ 4

~~【書類名】~~ ~~図面~~ Drawings
~~【図１】~~ Name of Document

Fig. 1

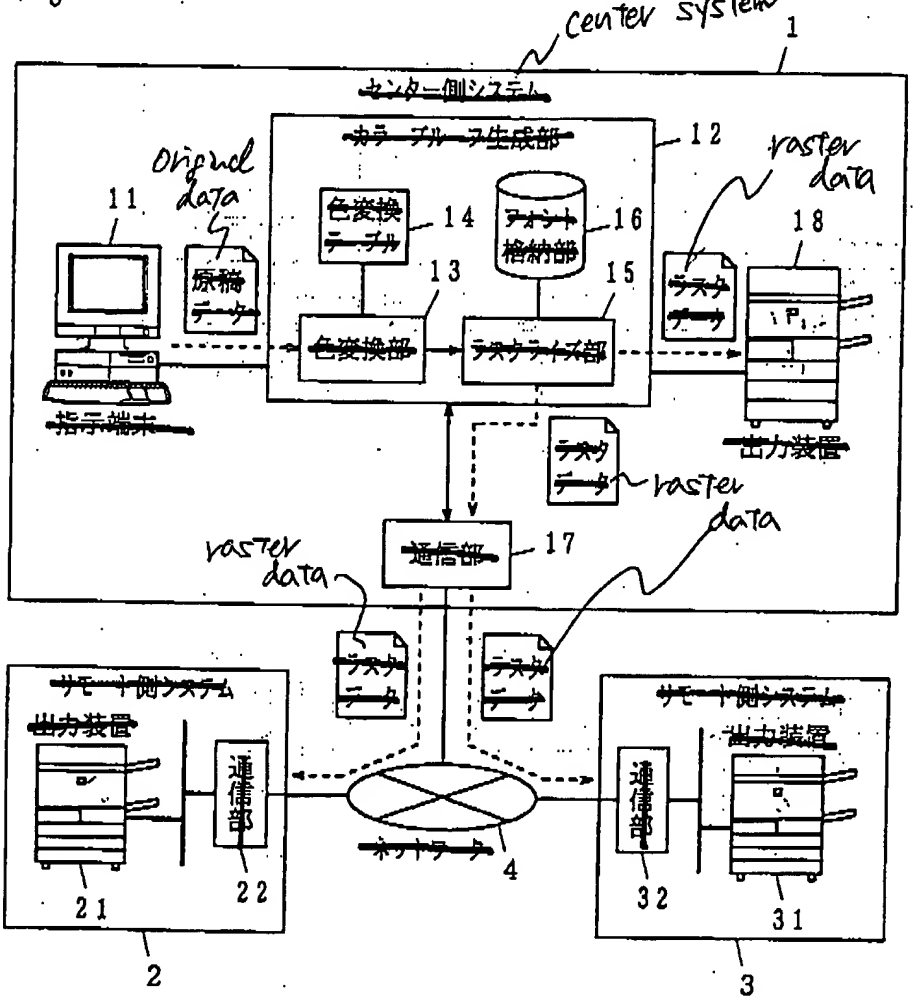

FIG. 1

1 CENTER SYSTEM

2 REMOTE SYSTEM

3 REMOTE SYSTEM

4 NETWORK

11 INSTRUCTION TERMINAL

12 COLOR PROOF PREPARATION SECTION

13 COLOR CONVERSION SECTION

14 COLOR CONVERSION TABLE

15 RASTERIZING SECTION

16 FONT STORAGE SECTION

17 COMMUNICATION SECTION

18 OUTPUT UNIT

21 OUTPUT UNIT

22 COMMUNICATION SECTION

31 OUTPUT UNIT

32 COMMUNICATION SECTION

~~【図２】~~

Fig. 2

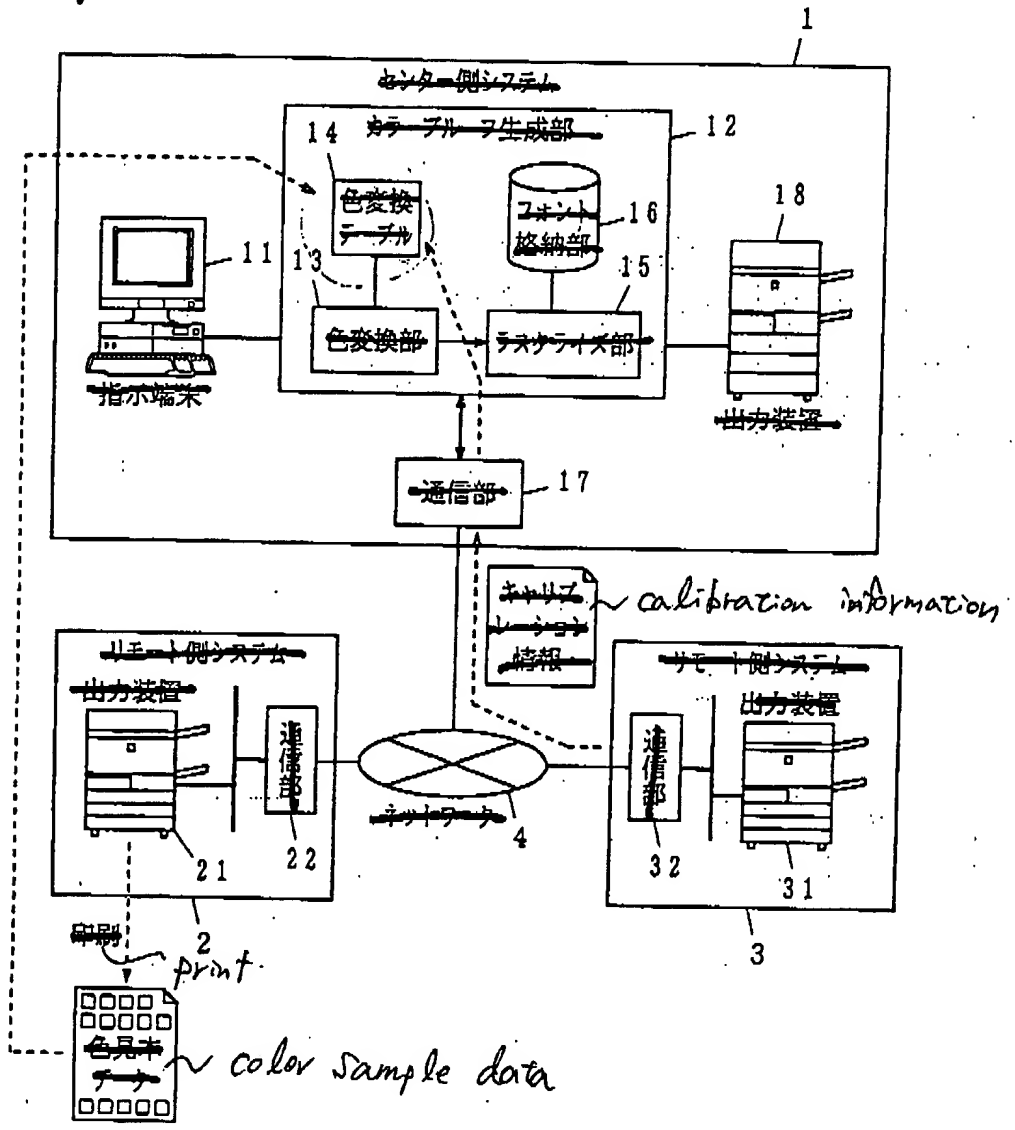

FIG. 2

1 CENTER SYSTEM

2 REMOTE SYSTEM

3 REMOTE SYSTEM

4 NETWORK

11 INSTRUCTION TERMINAL

12 COLOR PROOF PREPARATION SECTION

13 COLOR CONVERSION SECTION

14 COLOR CONVERSION TABLE

15 RASTERIZING SECTION

16 FONT STORAGE SECTION

17 COMMUNICATION SECTION

18 OUTPUT UNIT

21 OUTPUT UNIT

22 COMMUNICATION SECTION

31 OUTPUT UNIT

32 COMMUNICATION SECTION

~~【図３】~~

Fig. 3

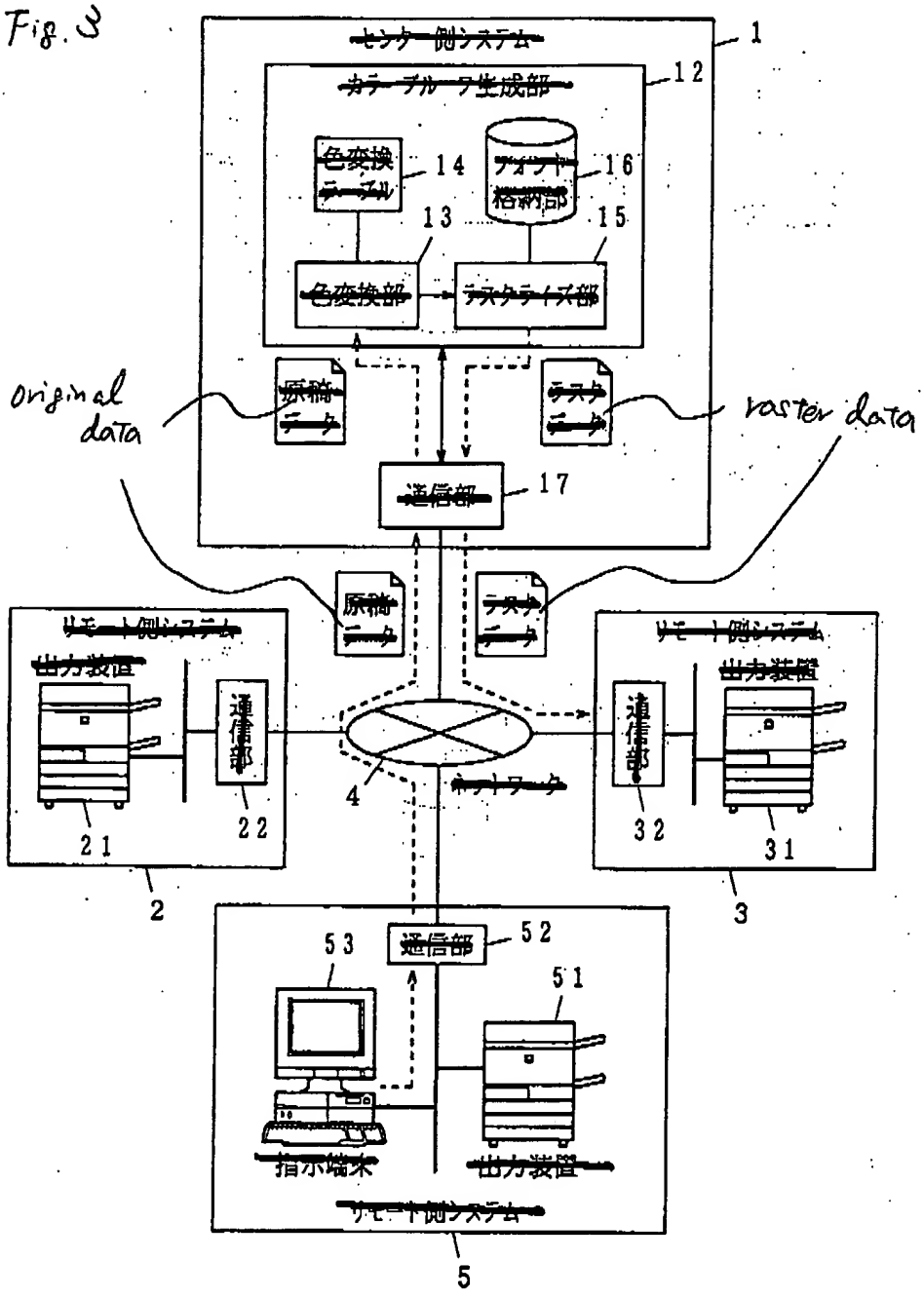

Fig. 3

1 CENTER SYSTEM

2 REMOTE SYSTEM

3 REMOTE SYSTEM

4 NETWORK

5 REMOTE SYSTEM

12 COLOR PROOF PREPARATION SECTION

13 COLOR CONVERSION SECTION

14 COLOR CONVERSION TABLE

15 RASTERIZING SECTION

16 FONT STORAGE SECTION

17 COMMUNICATION SECTION

21 OUTPUT UNIT

22 COMMUNICATION SECTION

31 OUTPUT UNIT

32 COMMUNICATION SECTION

51 OUTPUT UNIT

52 COMMUNICATION SECTION

53 INSTRUCTION TERMINAL

~~【図４】~~

Fig. 4

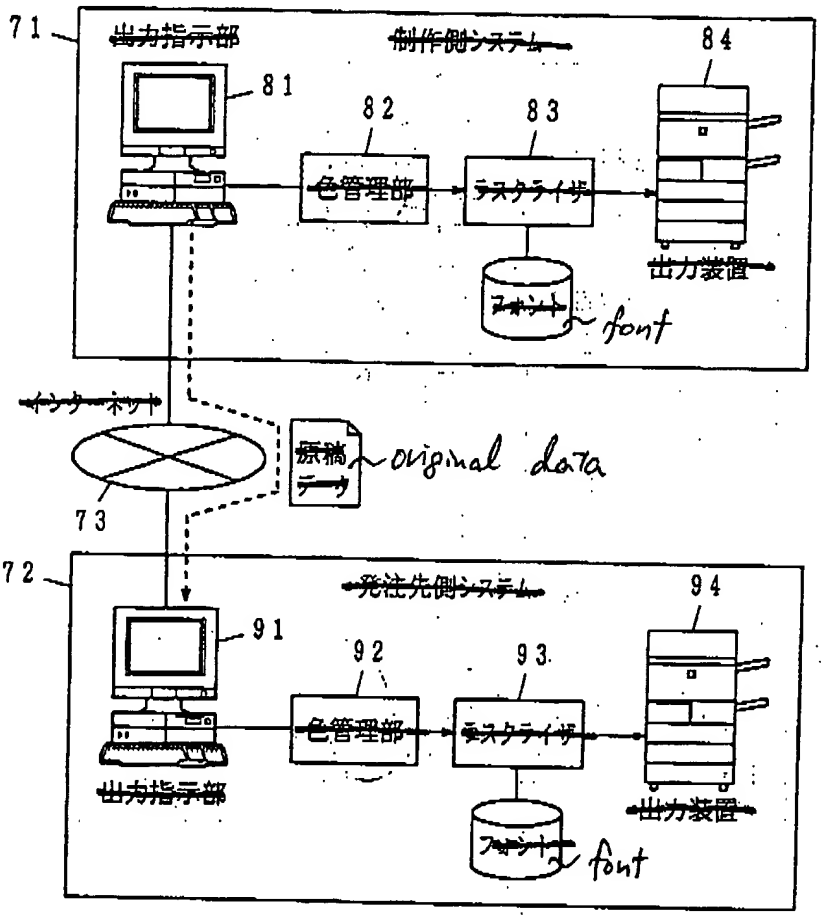

Fig. 4

71 PRODUCTION PARTY SYSTEM

72 ORDERED PARTY SYSTEM

73 INTERNET

81 OUTPUT INSTRUCTION SECTION

82 COLOR MANAGEMENT SECTION

83 RASTERIZER

84 OUTPUT UNIT

91 OUTPUT INSTRUCTION SECTION

92 COLOR MANAGEMENT SECTION

93 RASTERIZER

94 OUTPUT UNIT